

WHAT IS CLAIMED IS:

1. A system for detection and tracking of inanimate and animate objects, said system comprising:
 - a) a low radio frequency tag carried by each of the objects, said tag comprising a tag antenna operable at a low radio frequency not exceeding 1 megahertz, a transceiver operatively connected to said antenna, said transceiver being operable to transmit and receive data signals at said low radio frequency, a data storage device operable to store data comprising identification data for identifying said detection tag, a programmed data processor operable to process data received from said transceiver and said data storage device and to send data to cause said transceiver to emit an identification signal based upon said identification data stored in said data storage device, and an energy source for activating said transceiver and said data processor;
 - b) at least one field antenna disposed at an orientation and within a distance from each object that permits effective communication therewith at said low radio frequency;
 - c) a reader in operative communication with said field antenna, said reader being operable to receive data signals from said low frequency tags ;
 - d) a transmitter in operative communication with said field antenna, said transmitter being operable to send data signals to said low frequency tags; and
 - e) a central data processor (e.g. server) in operative communication with said reader and transmitter.
2. A system as set forth in Claim 1, said low radio frequency not exceeding 300 kilohertz.
3. A system as set forth in Claim 1, said field antenna, said reader, and said transmitter being combined into a unitary handheld device.
4. A system as set forth in Claim 2, said field antenna comprising a large

loop, said distance from said field antenna to each object not exceeding a major dimension of said loop.

5. A system as set forth in Claim 4, said objects and said field antenna being disposed in a repository selected from a truck, a warehouse, a freight container, and a sea vessel, said field antenna comprising a large loop, said distance from said field antenna to each object not exceeding a major dimension of said loop.

6. A system as set forth in Claim 1, wherein said identification data comprises an internet protocol (IP) address, and wherein said central data processor is operable for communication with an internet router.

7. A system as set forth in Claim 1, said tag further comprising a sensor operable to generate a status signal upon sensing a condition (e.g. temperature change, shock, dampness) experienced by an object that carries said detection tag, said transceiver being operable to automatically transmit a warning signal at said low radio frequency upon generation of said status signal.

8. A system as set forth in Claim 1, said tag further comprising at least one indicator device (e.g. colored LED, audible tone generator) which is automatically operable upon receipt by said transceiver of a data signal that corresponds to said identification data stored at said data storage device.

9. A system as set forth in Claim 1, said tag further comprising (i) a sensor operable to generate a status signal upon sensing a condition (e.g. temperature change, shock, dampness) experienced by an object that carries said detection tag and (ii) at least one indicator device (e.g. colored LED, audible tone generator) which is automatically operable upon generation of said status signal.

10. A system as set forth in Claim 1, said tag further comprising (i) a sensor operable to generate a status signal upon sensing a condition (e.g. temperature

change, shock, dampness) experienced by an object that carries said detection tag, (ii) a clock to generate a time signal corresponding to said status signal, said data storage device being operable to store corresponding pairs of status and time signals as a temporal history of conditions experienced by said object.

11. A system as set forth in Claim 10, . said transceiver being operable to automatically transmit said temporal history at said low radio frequency upon receipt by said transceiver of a data signal that corresponds to said identification data stored at said data storage device.

12. A system as set forth in Claim 1, said tag further comprising a display (e.g. LCD) operable to display data relating to said tag and an object carrying said tag.

13. A system as set forth in Claim 1, said tag further comprising key buttons operable for manual entry of data.

14. A system as set forth in Claim 1, said tag being formed with two major surfaces at opposite sides thereof, a first major surface on a first side of said tag being substantially flat to facilitate attachment to a surface of an object, a second major surface of said tag being substantially convex.

15. A system as set forth in Claim 14, said second major surface being tapered to a thin edge along a perimeter of said tag.

16. A system as set forth in Claim 15, said tag being provided with an transparent film overlying said second major surface, said film being removably adherent to said object while permitting visual inspection of said second major surface.

17. A system as set forth in Claim 16, said tag being provided with key buttons for manual entry of data, said second major surface being provided with an LCD display, and at least one LED indicator device.

18. A system as set forth in Claim 17, said first major surface being provided with said key buttons having frictional (e.g. rubberized) surfaces for reducing slippage with respect to said object.

19. A system as set forth in Claim 18 wherein said at least one of said key buttons is operable to automatically electronically detect whether or not the tag is in contact with a package or other object.

20. A system as set forth in Claim 1, said transceiver being normally ON to receive data signals.

21. A system as set forth in Claim 1, said programmed data processor of said tag being operable to compare a transmitted ID code with a stored ID code and, in the event of a match, to respond to said transmitted ID code.

22. A system as set forth in claim 21 , said programmed data processor of said tag being operable to compare a transmitted ID code from a server to a plurality of ID codes stored in said data storage device of said tag and, in the event of a match, to respond to said transmitted ID code.

23 A system as set forth in Claim 20 that can transmit a signal when a condition related to a sensor meets a preselected value.

24 A system as set forth in Claim 22, wherein the data storage device is programmable to store said plurality of ID codes.

25 A system as set forth in claim 21 wherein said stored ID codes that are programmable to enable erasure thereof and thereafter programming of other ID codes in said data storage device.

26 A system as set forth in Claim 7, said sensor further comprising a GPS detector.

27. A method for detection and tracking of inanimate and animate objects, said method comprising the steps of:

- a) attaching a low radio frequency detection tag to each of the objects, each tag comprising a tag antenna operable at a low radio frequency not exceeding 1 megahertz, a transceiver operatively connected to said antenna, said transceiver being operable to transmit and receive data signals at said low radio frequency, a data storage device operable to store data comprising identification data for identifying said detection tag, a programmed data processor operable to process data received from said transceiver and said data storage device and to send data to cause said transceiver to emit an identification signal based upon said identification data stored in said data storage device, and an energy source for activating said transceiver and said data processor;
- b) storing, in the data storage device of each tag, shipping data selected from object description data, address-of-origin data, destination address data, object vulnerability data, and object status data;
- c) commingling the objects in a repository selected from a warehouse and a truck, said repository being provided with at least one field antenna operable at said low radio frequency; said field antenna being disposed at a distance from each object that permits effective communication therewith at said low radio frequency
- d) reading the identification data and shipping data from the transceiver of each tag by interrogating all tags in said repository with RF interrogation signals at a low radio frequency not exceeding 1 megahertz via said field antenna;
- e) transmitting the identification data and shipping data from each tag to a central data processor to provide a tally of the objects in said repository.

28. A method as set forth in Claim 27, said tag further comprising a sensor operable to generate a status signal upon sensing a condition (e.g. temperature

change, shock, dampness) experienced by an object that carries said detection tag, said method further comprising the step of:

(f) automatically transmitting a warning signal from said transceiver at said low radio frequency to said central data processor upon generation of said status signal.

29. A method as set forth in Claim 27, said tag further comprising (i) a sensor operable to generate a status signal upon sensing a condition (e.g. temperature change, shock, dampness) experienced by an object that carries said detection tag and (ii) at least one indicator device (e.g. colored LED, audible tone generator), said method further comprising the step of:

(g) automatically activating said at least one indicator device upon generation of said status signal.

30. A method as set forth in Claim 27, said tag further comprising (i) a sensor operable to generate a status signal upon sensing a condition (e.g. temperature change, shock, dampness) experienced by an object that carries said detection tag and (ii) a clock to generate a time signal corresponding to said status signal, said method further comprising the steps of:

(h) storing corresponding pairs of status and time signals as a temporal history of conditions experienced by said object; and

(j) transmitting, to said central data processor, said temporal history at said low radio frequency upon receipt by said transceiver of a data signal that corresponds to said identification data stored at said data storage device.

31. A detection tag for detection and tracking of animate and inanimate objects, said detection tag comprising:

a) an antenna operable at a low radio frequency not exceeding 1 megahertz;

b) a transceiver operatively connected to said antenna, said transceiver being operable to transmit and receive data signals at said low radio frequency;

c) a data storage device operable to store data comprising identification data for

identifying said detection tag;

d) a data processor operable to process data received from said transceiver and said data storage device and to send data to cause said transceiver to emit an identification signal based upon said identification data stored in said data storage device;

e) an energy source for activating said transceiver and said data processor.

32. A detection tag as set forth in Claim 31, further comprising a sensor operable to generate a status signal upon sensing a condition (e.g. temperature change, shock, dampness) experienced by an object that carries said detection tag, said transceiver being operable to automatically transmit a warning signal at said low radio frequency upon generation of said status signal.

33. A detection tag as set forth in Claim 31, further comprising at least one indicator device (e.g. colored LED, audible tone generator) which is automatically operable upon receipt by said transceiver of a data signal that corresponds to said identification data stored at said data storage device.

34. A detection tag as set forth in Claim 31, further comprising (i) a sensor operable to generate a status signal upon sensing a condition (e.g. temperature change, shock, dampness) experienced by an object that carries said detection tag and (ii) at least one indicator device (e.g. colored LED, audible tone generator) which is automatically operable upon generation of said status signal.

35. A detection tag as set forth in Claim 31, further comprising (i) a sensor operable to generate a status signal upon sensing a condition (e.g. temperature change, shock, dampness) experienced by an object that carries said detection tag, (ii) a clock to generate a time signal corresponding to said status signal, said data storage device being operable to store corresponding pairs of status and time signals as a temporal history of conditions experienced by said object.

36. A detection tag as set forth in Claim 35, said transceiver being operable

to automatically transmit said temporal history at said low radio frequency upon receipt by said transceiver of a data signal that corresponds to said identification data stored at said data storage device.

37. A detection tag as set forth in Claim 31, and further comprising a display (e.g. LCD) operable to display data relating to said tag and an object carrying said tag.

38. A detection tag as set forth in Claim 31, and further comprising key buttons operable for manual entry of data.

39. A detection tag as set forth in Claim 31, said tag being formed with two major surfaces at opposite sides thereof, a first major surface on a first side of said tag being substantially flat to facilitate attachment to a surface of an object, a second major surface of said tag being substantially convex.

40. A detection tag as set forth in Claim 39, said second major surface being tapered to a thin edge along a perimeter of said tag.

41. A detection tag as set forth in Claim 40, said tag being provided with an transparent film overlying said second major surface, said film being removably adherent to said object while permitting visual inspection of said second major surface.

42. A detection tag as set forth in Claim 41, said tag being provided with key buttons for manual entry of data, said second major surface being provided with an LCD display, and at least one LED indicator device.

43. A detection tag as set forth in Claim 42, said first major surface being provided with said key buttons having frictional (e.g. rubberized) surfaces for reducing slippage with respect to said object.

44. A detection tag as set forth in Claim 43 wherein said at least one of said key buttons is operable to automatically electronically detect whether or not the tag is in contact with a package or other object.

45. A detection tag as set forth in Claim 31, said transceiver being normally ON to receive data signals.

46. A detection tag as set forth in Claim 31, said programmed data processor of said tag being operable to compare a transmitted ID code with a stored ID code and, in the event of a match, to respond to said transmitted ID code.

47. A detection tag as set forth in claim 46, said programmed data processor of said tag being operable to compare a transmitted ID code from a server to a plurality of ID codes stored in said data storage device of said tag and, in the event of a match, to respond to said transmitted ID code.

48 A detection tag as set forth in Claim 45 that can transmit a signal when a condition related to a sensor meets a threshold value

49 A detection tag as set forth in Claim 47, wherein the data storage device is programmable to store said plurality of ID codes.